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April 17, 1998

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Ms. Magalie Roman Salas
Secretary - Federal Communications Commission
1919 M Street, N.W. Room 222
Washington, D.C. 20554

RE: CC Docket Nos. 96-45 and 97-160

Dear Ms. Salas,

On April 16, 1998, Jim Sichter, Brian Staihr, and Pete Sywenki of Sprint met with Brian Clopton, Natalie Wales, Brad Wimmer, Don Stockdale, Chuck Keller, Craig Brown, and Richard Smith of the Universal Service Division of the Common Carrier with regard to the above referenced dockets. In this meeting, we discussed the status of the cost proxy model platforms currently under the FCC's consideration for use in determining universal service funding for high cost areas. The attached information was discussed in the meeting. These attached materials illustrate the methodology by which customer locations are converted into serving areas for use in the HAI model and point out the way in which this approach significantly understates required distribution facilities.

Included in these materials are estimated distances (lengths) between customer location points within specific clusters. The calculation of these distances was developed by Sprint staff during an on-site review of PNR geo-coded data at PNR Associates (the vendor used by HAI for customer location points and clustering). This review was arranged in response to Sprint's requests during recent Nevada PUC costing proceedings. The information provided during our April 16 meeting did not include any actual customer locations or any other information proprietary to PNR.

The original and three copies of this notice are being submitted to the Secretary of the FCC in accordance with Section 1.1206(a)(1) of the Commission's rules. If there are any questions, please call.

Sincerely,

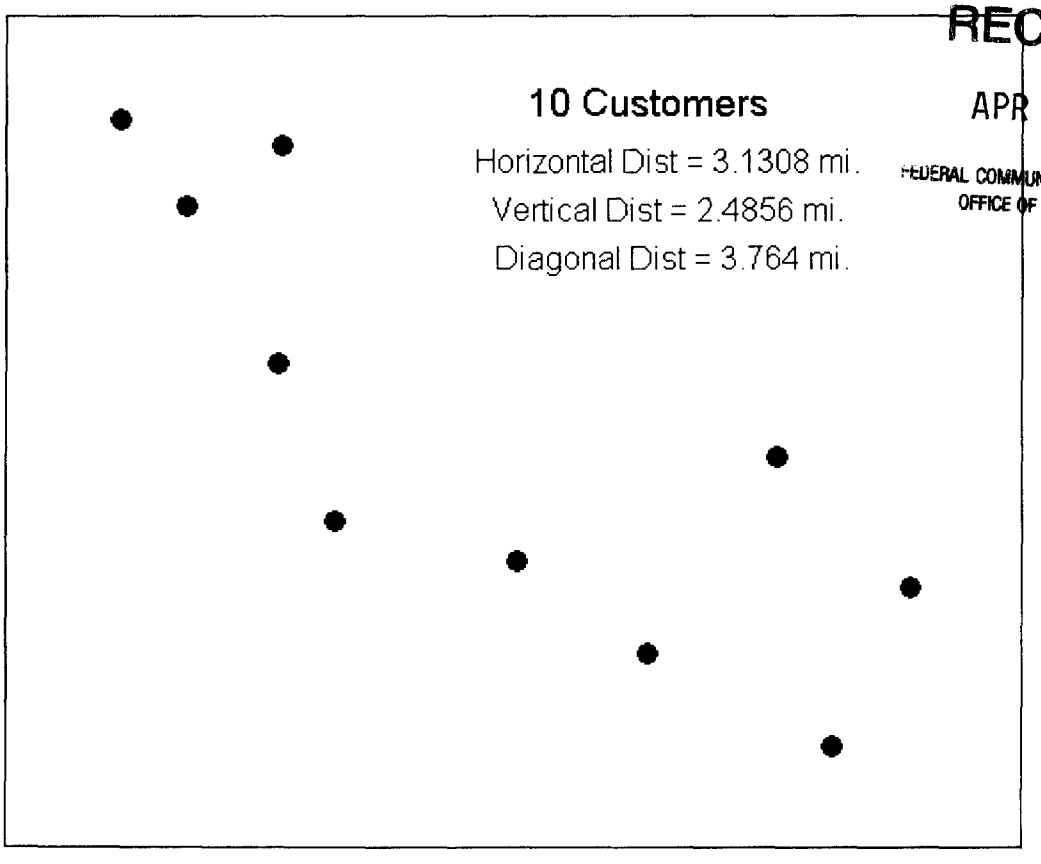
Pete Sywenki

Attachments

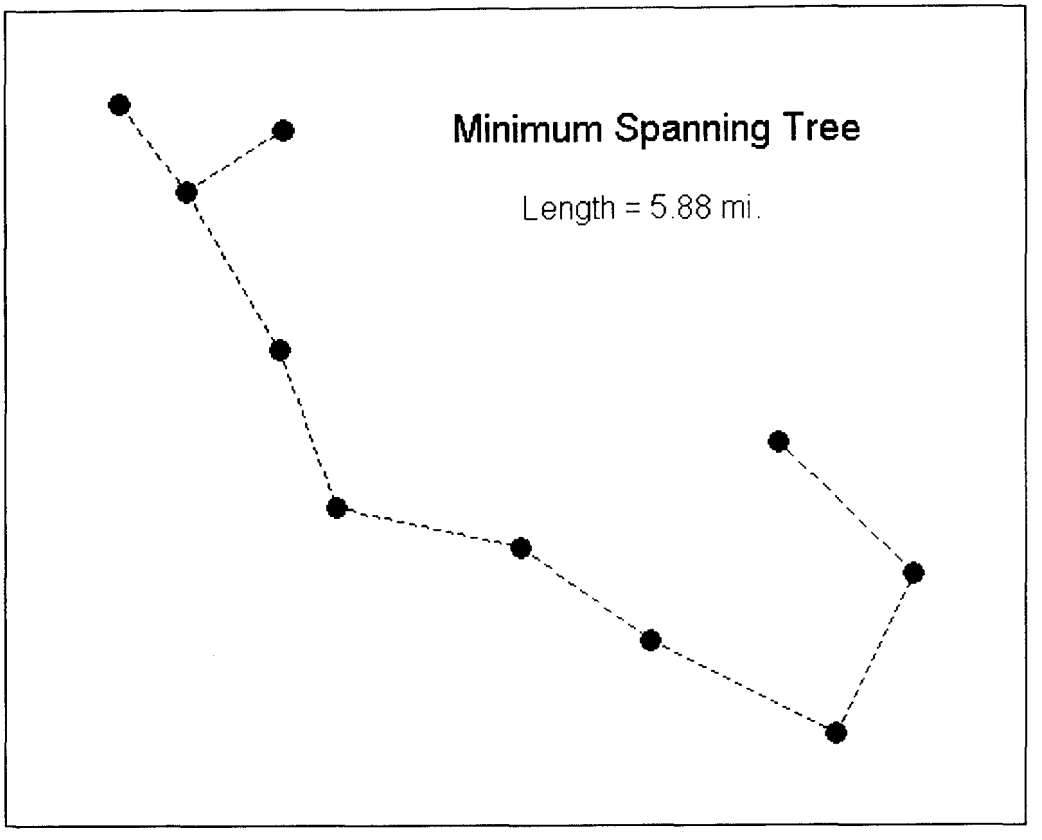
cc: Brian Clopton, Chuck Keller, Brad Wimmer, Natalie Wales, Don Stockdale, Craig Brown, Richard Smith

Hatfield's Polygons Converted to Rectangles

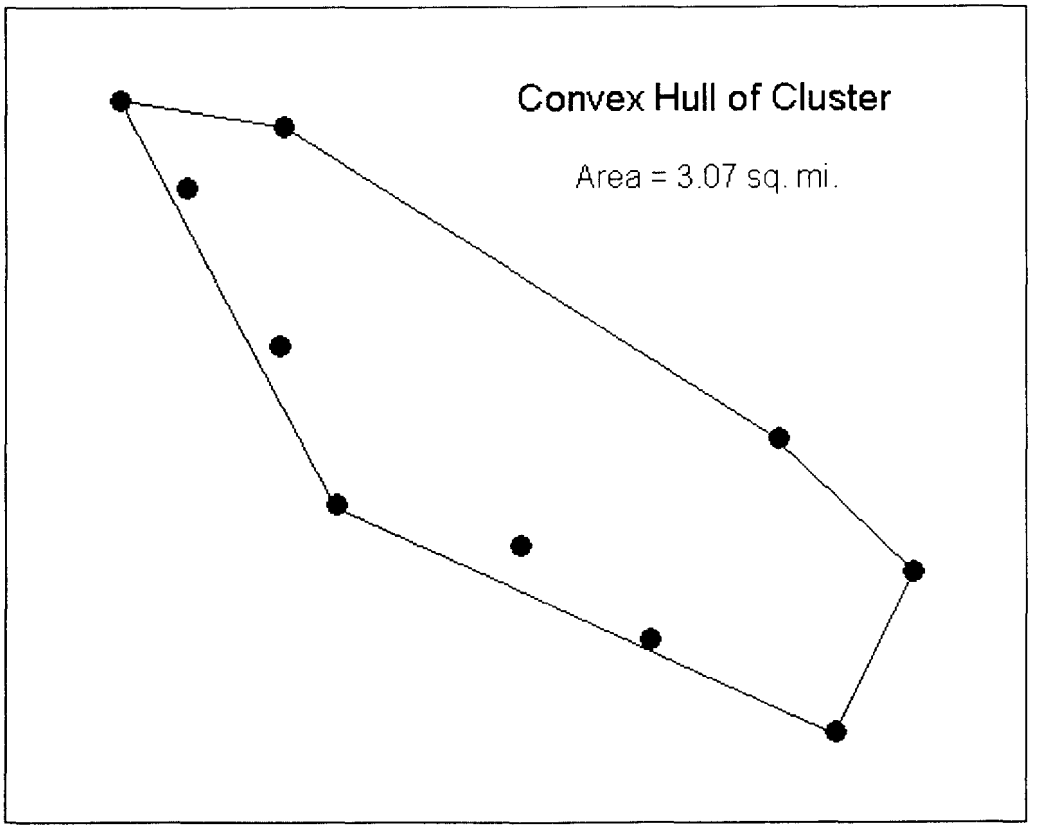
The Hatfield 5.0a Model groups a set of "actual" customer points into a *cluster*, according to a set of aggregation rules.



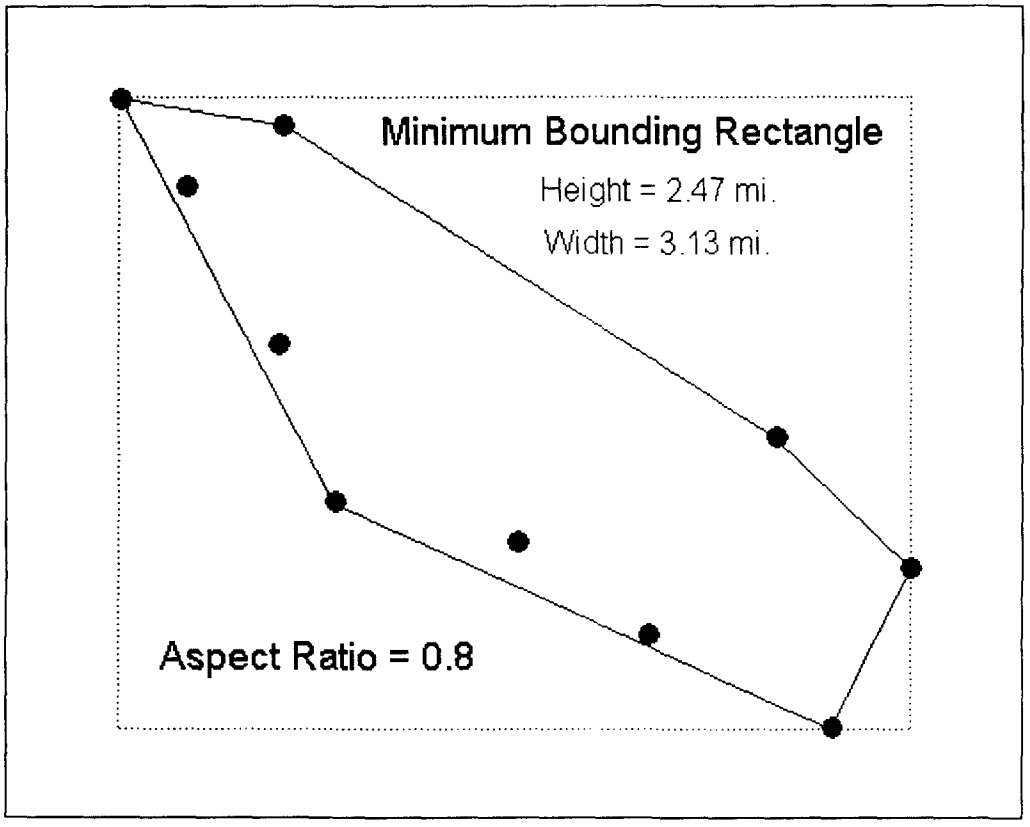
We have determined that the *minimum spanning tree* for these points – the mathematically shortest connection possible for these points – is 5.88 miles.



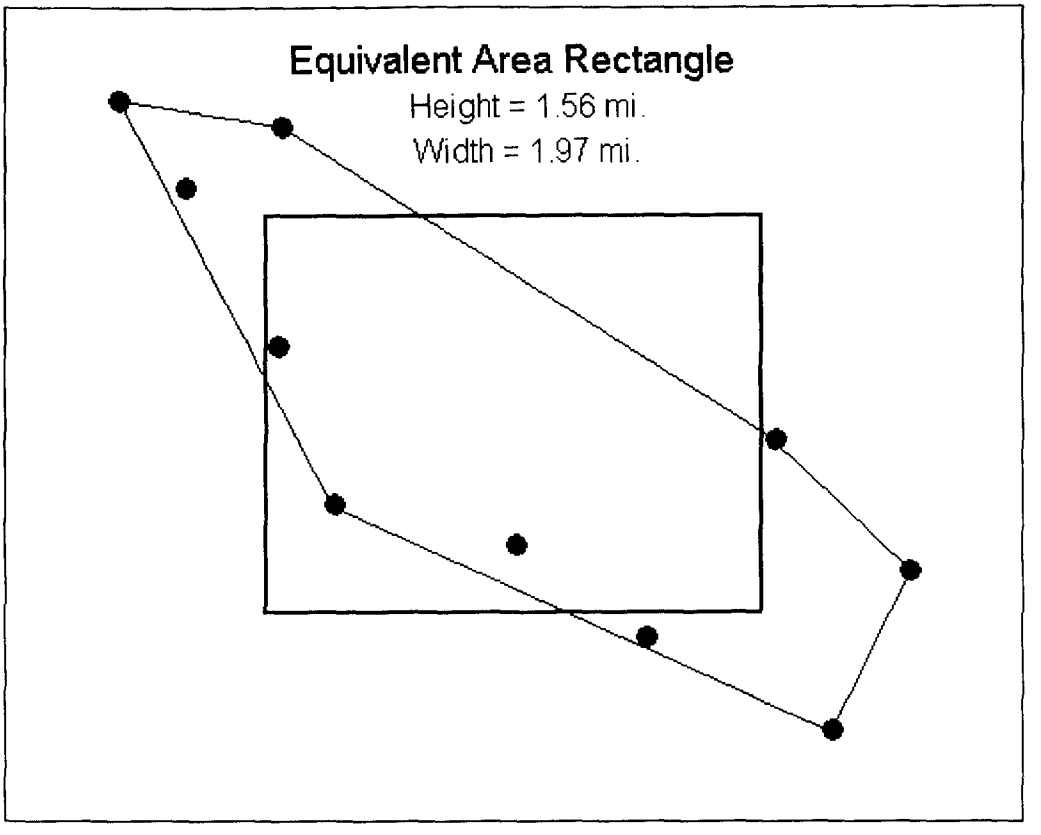
When Hatfield has determined the set of points that constitute a cluster, it logically draws a *convex hull* around those points, and determines its area.



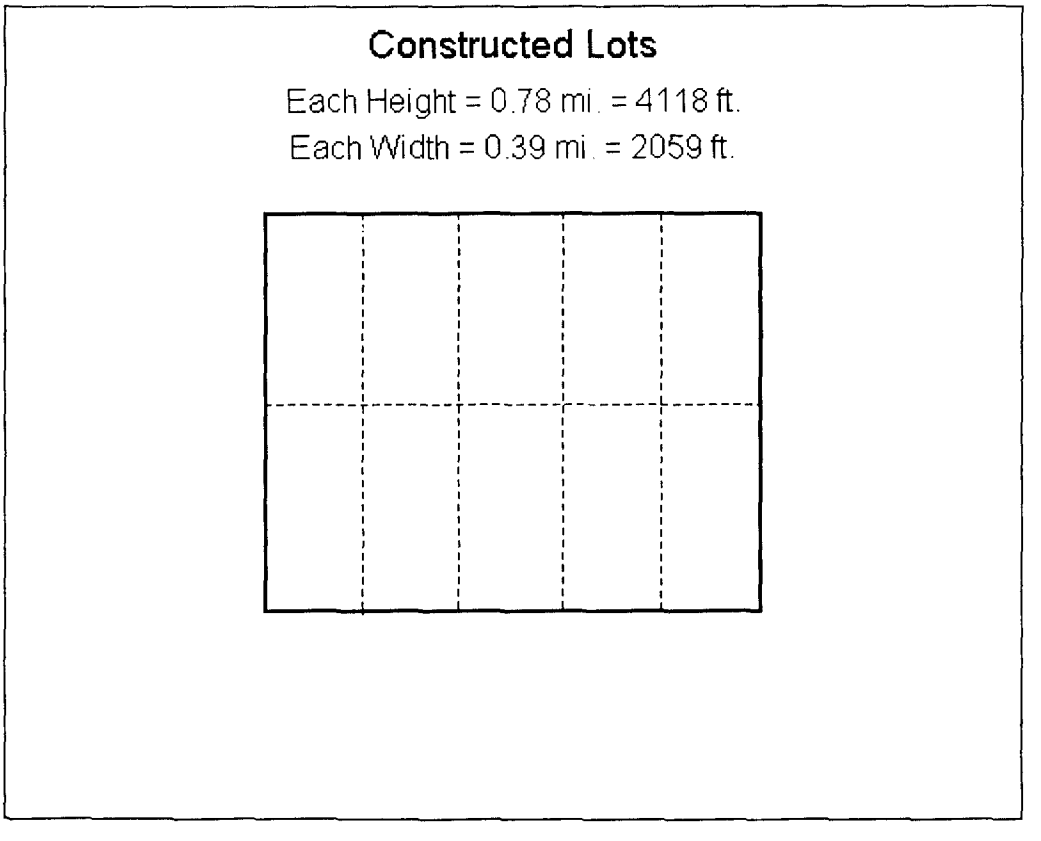
Hatfield then logically constructs a *minimum bounding rectangle* – oriented north-south-east-west – that exactly bounds the cluster's points. Hatfield then determines the *aspect ratio* of that rectangle (that is, the ratio of the rectangle's height to its width) ... in this case, 0.8.



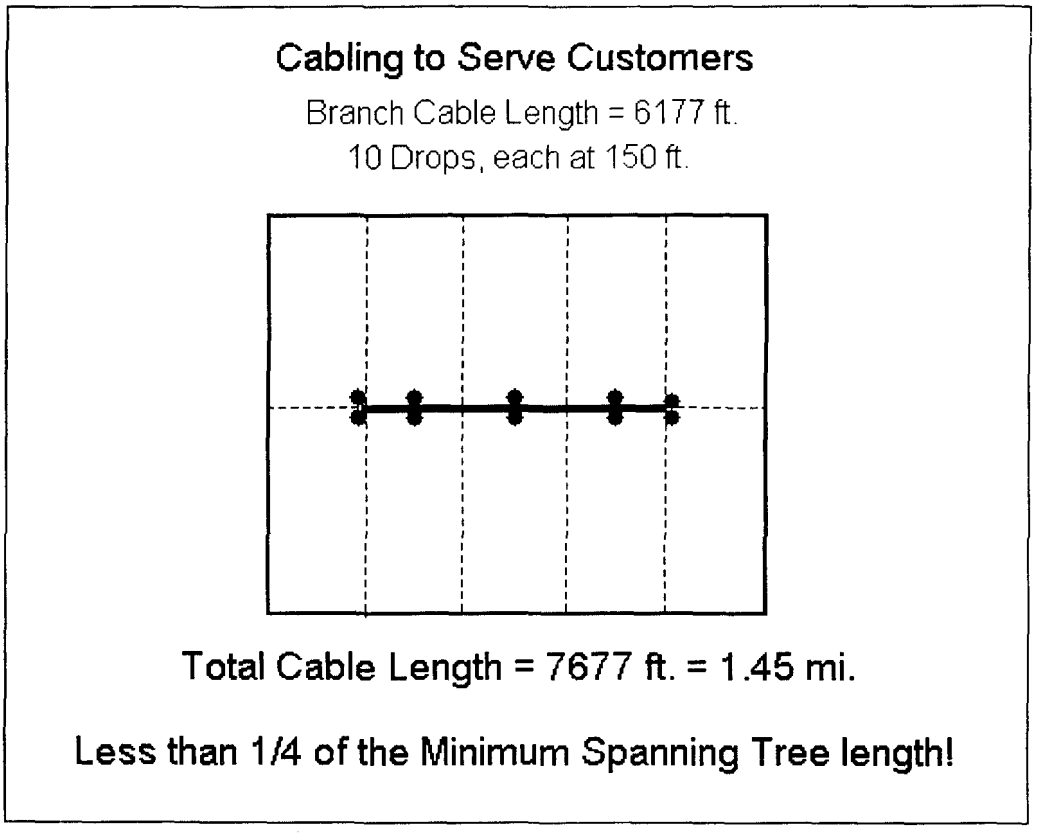
Hatfield then constructs a *rectangle* with the above aspect ratio; the *size* of that rectangle is determined, of course, by its *area* ... and that area is set to be the *area of the convex hull* ... in this case, 3.07 square miles.



Hatfield then constructs *lots* within this constructed rectangle. Each lot is twice as high as it is wide.



A *branch cable* is then constructed, and 150 ft. drops connect to the customers.



But note how closely the customers are squeezed toward the branch cable. The arrangement is unrealistic, both from the standpoint of cable length *and* from the standpoint of area served.

Customer Area Served

Height = 300 ft.

Width = 106 + 6177 + 106 ft. = 6389 ft.

Area Served = 1,916,700 sq. ft. = 0.0688 sq. mi.

But Actual Cluster Area = 3.07 sq. mi.

Area Modeled is 1/44 of Cluster Area

So, HOW BAD CAN THIS BE?

To what extent does the combined effect of:

1) converting the polygon into a rectangle (with identical area) and
2) building cable only to the point where the perimeter lots start
3) assuming all customers have drops 150 feet or less

cause the model to UNDERSTATE the amount of cable needed to transverse the ACTUAL distances between customers?

The following table shows a sample of several individual clusters (not wire centers) in Nevada (Nevada Bell territory).

The table gives an example of the amount of cable needed to reach all actual customer locations in the cluster. The locations do NOT include any outlier locations. The distance reported is only the distance between points that reside in the main clusters.

This length represents an approximation of the amount of distribution that the Hatfield Model (or any proxy model) should build in the course of laying out the network and determining the associated cost.

The table also shows the amount of actual distribution the Hatfield Model builds to each respective cluster (again, excluding outlier points).

Cluster Number	Absolute Minimum Distance Between Cluster Points (in feet)	Total Amount of Distribution Cable Built by Hatfield Model (in feet)
CHBTNV11.C003	23,500	7,900
IMLYNV12.C022	29,000	2,210
UPMDNVXF.C005	29,000	836
IMLYNV12.C015	38,000	2,089
DYTNNV11.C004	21,000	1,494
EMPRNV11.C004	21,500	5,093
EMPRNV11.C003	24,500	0

WHAT DOES THIS EVIDENCE EXPLAIN?

CONCLUSION #1: The Hatfield Sponsors' claim the placing surrogate points on the perimeters of CBs is a conservative approach (causing the model to overstate customer dispersion and therefore overstate required feet of plant) is completely false.

FACT: When points are placed in an (approximately) straight line, the area of the resulting polygon is miniscule and the converted rectangle with identical area distorts (understates) actual customer dispersion immensely.

CONCLUSION #2: This phenomenon has nothing to do with geocoding.

FACT: The understatement of plant does not depend on points being actual or surrogate. If a cluster is made up of 100% actual geocoded points and those points happen to be stretched out in a semi-linear fashion (i.e. along a road where geocoding places points), the same distortion will take place.

CONCLUSION #3: This also explains the significant differences in route mileage produced by the BCPM and the Hatfield Model for the same wire centers.

FACT: In many cases the BCPM estimates 10 times more distribution cable for a given wire center than the Hatfield Model does. Looking at only four clusters in the Imlay, NV wire center, we produce the same table:

Wire Center	Absolute Minimum Distance Between Cluster Points (in feet)	Total Amount of Distribution Cable Built by Hatfield Model (in feet)
4 Clusters in Imlay, NV (aggregated)	140,000	17,000